

ABSTRACT

A fiberscope device is disclosed which is suitable for video imaging, laser Raman spectroscopy and laser Raman spectroscopic (i.e. chemical) imaging. The fiberscope design minimizes fiber background interference arising from the laser delivery fiber optic and the coherent fiber optic light gathering bundle while maintaining high light throughput efficiency through the use of integrated spectral filters. In the fiberscope design, the laser delivery fiber optic is offset from the coherent fiber optic light gathering bundle. The laser delivery field is captured entirely by the light gathering field of view of the coherent fiber bundle. The fiberscope incorporates spectral filter optical elements that provide environmental insensitivity, particularly to temperature and moisture. The fiberscope is suited to the analysis of a wide range of condensed phase materials (solids and liquids), including the analysis of biological materials such as breast tissue lesions and arterial plaques, in such a manner to delineate abnormal from normal tissues.